

REMARKS

Claims 38 and 40 are amended, no claims are canceled, and no claims are added; as a result, claims 10-38 and 40 are now pending in this application.

§102 Rejection of the Claims

Claims 38 and 40 were rejected under 35 USC § 102(b) as being anticipated by Applicant's Admitted Prior Art. Applicant respectfully traverses this rejection and submits that the amendments to independent claims 38 and 40 contained herein will make the meaning of the claims more clearly understood.

Independent claim 38, as amended herein, recites that the "*region in contact with the collector and the base*" has "*a larger lateral extent than the emitter-base surface, and a smaller lateral extent than the base*". This claimed feature is shown, for example, in figure 10 as region 1020 and discussed in the specification at least at page 4, line 12 to page 5, line 15, where the region is disclosed to be enough larger than the emitter 1114 (see figure 11) to reduce the number of injected carriers reaching the collector 1016 without passing through the region 1020. The region 1020 is also disclosed as being smaller than the base 918 area (see figure 9 and page 5, line 21). Thus the language of independent claim 38, as currently amended, is patentably distinct over the cited reference of the AAPA as represented in figure 1.

Independent claim 40, as amended herein, recites that the "*the region including a first surface in contact with the base and a second surface in contact with the collector, the first surface being larger than the emitter-base surface and smaller than the base-collector surface*". Applicant respectfully submits that the language of claim 40 is patentably distinct over the AAPA at least for many of the same reasons given above with reference to independent claim 38, specifically that the AAPA shows a local implant region that has a lateral extent that is either substantially the same as the base (see figure 1), or substantially the same as the emitter. Thus the language of independent claim 49, as currently amended, is patentably distinct over the cited reference of the AAPA. Applicant respectfully requests that this rejection be withdrawn.

§103 Rejection of the Claims

Claims 10-37 were rejected under 35 USC § 103(a) as being unpatentable over Grubisich (U.S. Patent No. 5,581,115). Applicant respectfully traverses this rejection. Applicant notes that the outstanding Office Action lists this rejection as being under 35 USC § 103(a) in paragraph 3, but argues in paragraph 4 under 35 USC § 102(b). Applicant will respond to this rejection under both sections to avoid being unresponsive.

The cited reference of Grubisich is seen as teaching a method of increasing the base doping 76 along the edge of the field isolation oxide structure 64 to increase the emitter 70A to collector 66 breakdown voltage and reduce the emitter to collector leakage current along the field isolation edge (see figure 3A, 3B and column 8, line 21 to column 10, line 7). The special collector zone 88 as taught in the cited reference and shown at least in figures 3, 4, 5, 6, 7 and 8 is formed through the emitter opening and is substantially the same lateral extent as the emitter in one horizontal direction, and less than the emitter in what is called the “walled” direction. Thus the cited reference does not have an implanted region at the collector base junction that is larger than the emitter, nor is there any suggestion in the cited reference that Applicant can find that there would be a benefit to making the special collector zone 88 larger than the emitter to base area. Further, there is no suggestion that there would be a practical method to form a special collector zone 88 that would be aligned to the emitter opening but substantially larger than the emitter. Thus the cited reference is seen as teaching and suggesting an implant that is the same lateral extent as the emitter in one horizontal direction, and smaller than the emitter in the other horizontal direction.

Independent claim 10 recites “*an implant area of the collector region vertically adjacent to the base region having an increased collector doping of an implanted impurity, the implant area having an effective surface area, which is in contact with the base region, greater than the surface area of the emitter and less than the surface area of the base region*”, which claimed feature is not found in the cited reference. The cited reference discloses a special collector zone 88 that is substantially the same extent as the emitter 70 in one direction, and smaller than emitter 70 in the perpendicular horizontal direction. This is most easily seen in figure 4 where region 88 is smaller than the emitter 70. Thus the cited reference does not disclose at least the above noted claimed feature and is thus an inappropriate anticipation reference. The cited

reference does not disclose or suggest that there would be a reason or method to form a region 88 that was larger than the emitter, and actively teaches away from this feature by pulling the edges of the region 88 away from the “walled” edges of the emitter 70, which feature is discussed in the specification of the cited reference at least at column 10, line 7. The cited reference, whether taken alone or in any combination with well know prior art, does not describe or suggest the claimed feature of an implanted collector region that is *greater than the surface area of the emitter*, and is thus an inappropriate obviousness reference. Applicant respectfully requests that this rejection of independent claim 10 be reconsidered and withdrawn.

Independent claims 13, 17, 25, 33 and 34 have very similar claim language to claim 10 discussed above, specifically that the implant area is greater than the emitter and less than the base region. Applicant therefore requests that this rejection of independent claims 13, 17, 25, 33 and 34 be reconsidered and withdrawn.

Independent claim 30 recites “*an area of the collector region vertically adjacent the base region having an increased collector doping of the first conductivity type, the area of the collector region having an effective surface area in contact with the base region that is greater than the surface area of the emitter*”, which feature is not found, nor suggested in the cited reference. The cited reference teaches that the lateral extent of the region 88 should be substantially similar to the emitter in one direction, and shorter than the emitter in the other lateral direction, thus being smaller than the surface area of the emitter. Applicant therefore requests that this rejection of independent claim 30 be reconsidered and withdrawn.

The dependent claims are seen as being patentable over the cited reference, whether taken alone or in any combination with other well known prior art, at least as being dependent on base claims shown above to be patentably distinct and non-obvious over the reference. Applicant therefore requests that this rejection be reconsidered and withdrawn.

CONCLUSION

Applicant respectfully submits that the claims are in condition for allowance, and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's attorney, David Suhl, at (508) 865-8211 to facilitate prosecution of this application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

Respectfully submitted,

MICHAEL P. VIOLETTE

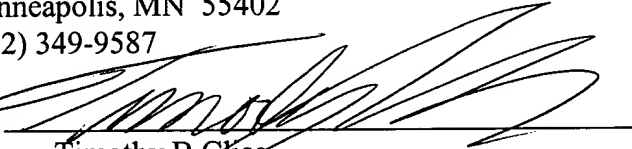
By his Representatives,

SCHWEGMAN, LUNDBERG, WOESSNER & KLUTH, P.A.
P.O. Box 2938
Minneapolis, MN 55402
(612) 349-9587

Date

22 Oct '04

By


Timothy B Clise
Reg. No. 40,957

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